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Supplement of

Contrasting physical properties of black carbon in urban Beijing between winter and summer

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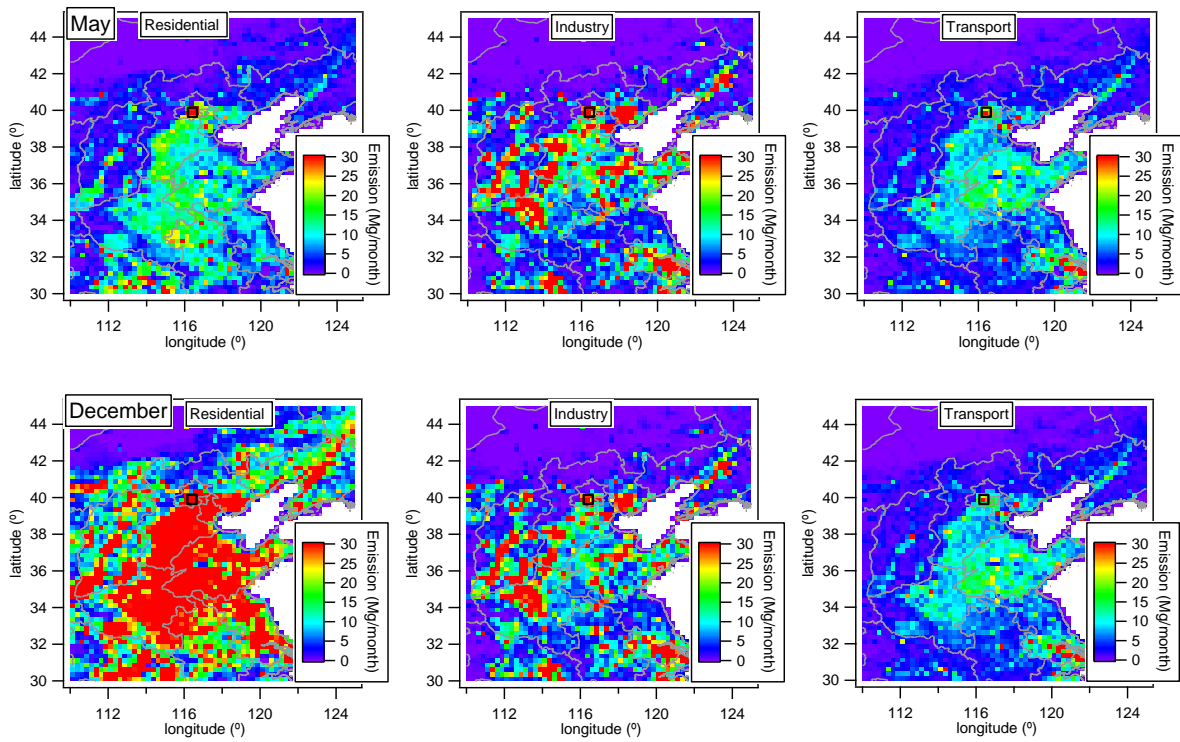


Figure. S1. The 2010 $0.5^{\circ} \times 0.5^{\circ}$ BC emission inventories for residential, industry and transportation sectors for May and December. The open square marks the location of central Beijing.

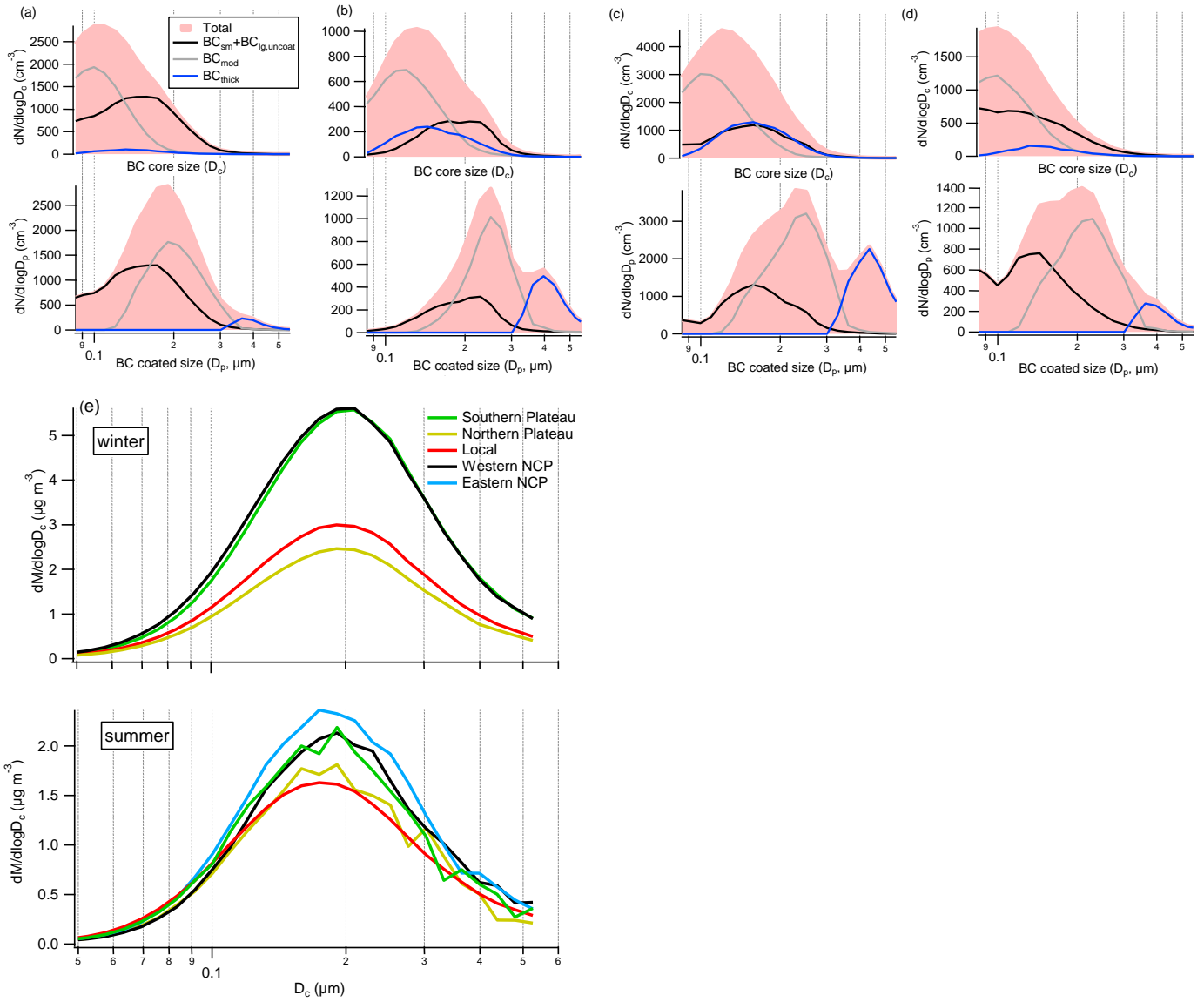
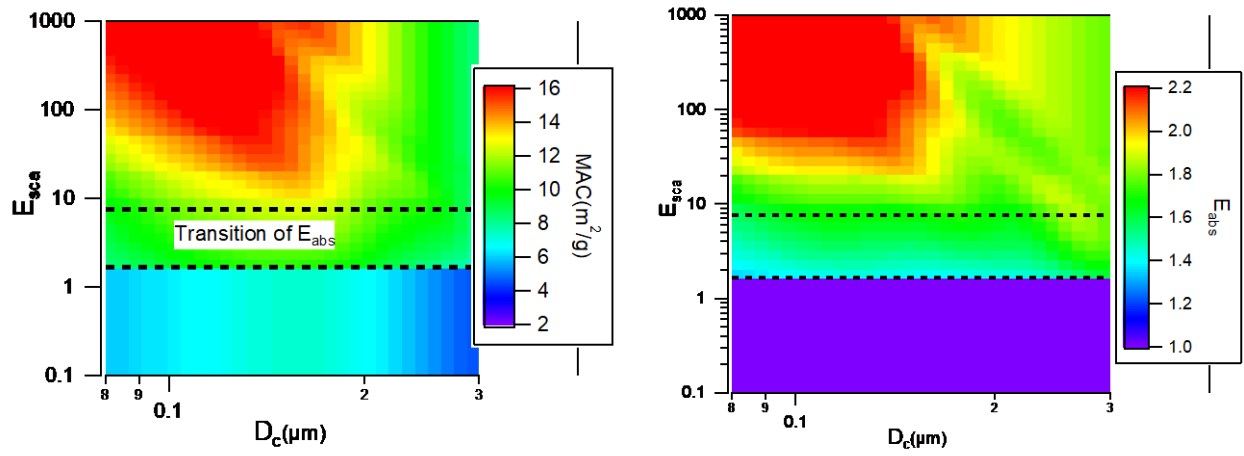


Figure S2. (a-d) The rBC core size (top panels) and coated BC (bottom panels) number size distribution for separated BC types, and the red shades show the total. Each panel corresponds to the periods shown in panels a) - d) of Fig. 9. (e) rBC core size distribution for classified air mass types in both seasons.

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40 Figure. S3. Modelled MAC_{550} and absorption enhancement (E_{abs}) mapped on the E_{sca} - D_c plot according to the scenario proposed in Liu et al., 2017. The area between both dashed lines shows the transition region of E_{abs} .

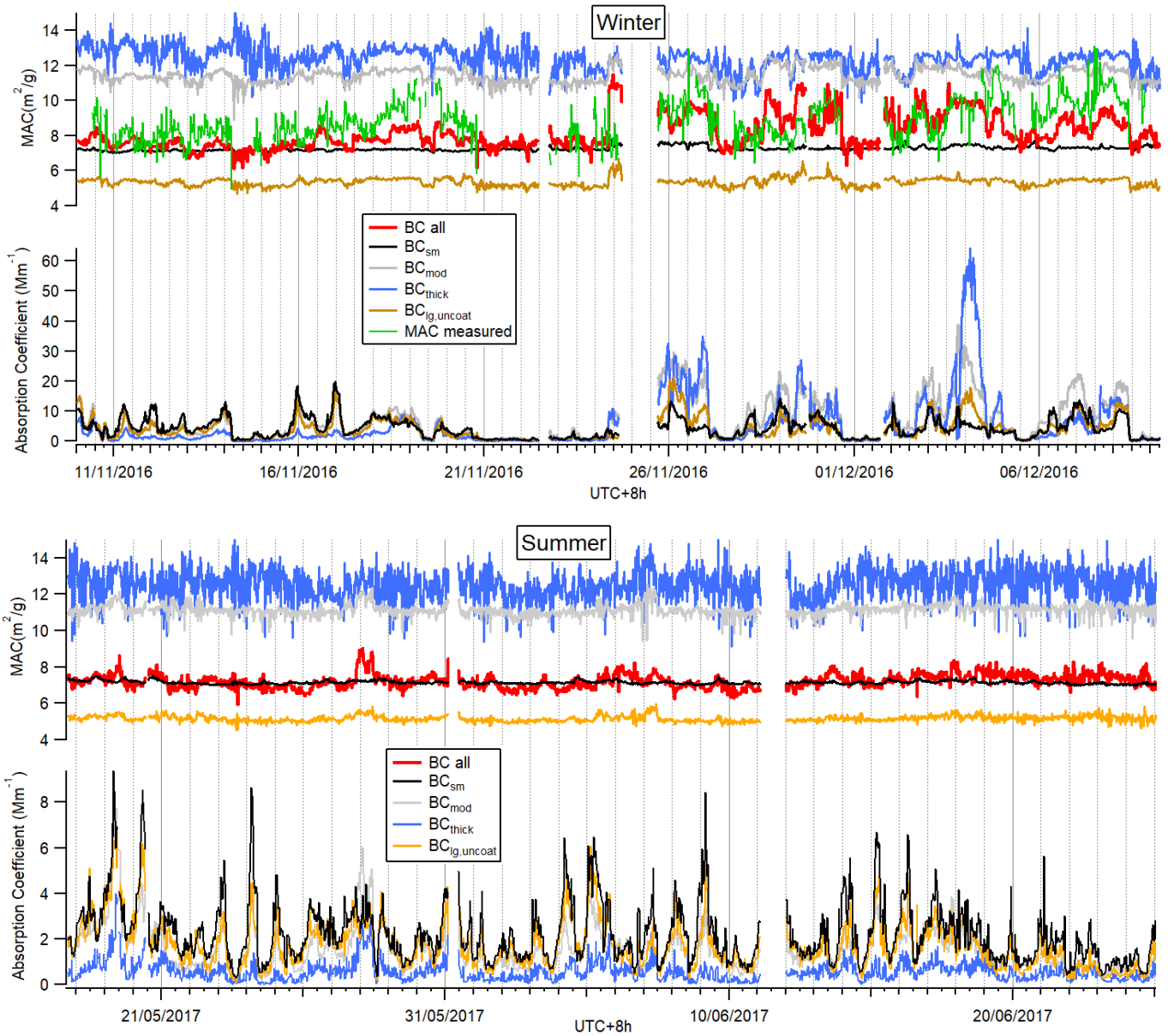
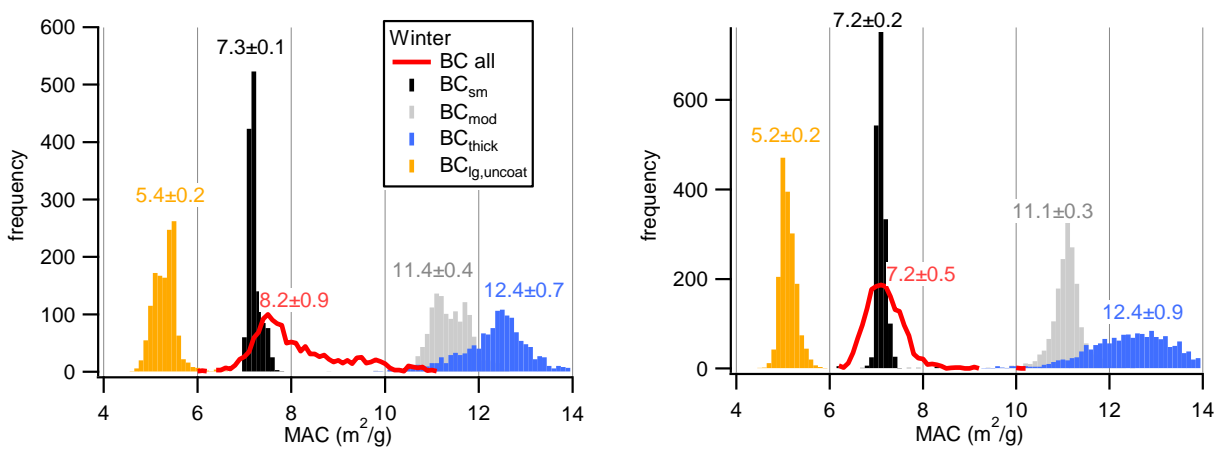


Fig. S4. The temporal variation of calculated MAC_{550} for total and each BC category. The green line indicates the measured MAC by PAX in winter.



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Figure S5. MAC_{550} of all BC types. The values on each histogram shows the mean $\pm 1\sigma$.